Controlling Hickory Shuckworm

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Most pecan workers rate the hickory shuckworm, *Cydia caryana* (Fitch), second only to the pecan weevil as a pecan pest. This pest is regulated in an attempt to stop it from moving west into Arizona and California. It has already moved into west Texas and New Mexico. In late 1990, the pest was confirmed within the city limits of El Paso. During the fall of 1991, seven hickory shuckworm moths were captured and identified in the Mesilla Valley from three locations in the southern end of the valley near the Texas-New Mexico border and five miles north of the Las Cruces city limits. It is imperative that everyone working in the New Mexico pecan industry become familiar with this pest to minimize its impact on the industry.

DESCRIPTION

The hickory shuckworm is a native pest found throughout most of the eastern pecan growing area from Texas, Oklahoma, and Kansas east to South Carolina. As the name implies, this pest is found on several species of hickory nuts. It has also been reported on black walnut.

The adult hickory shuckworm is a small, gray to smokey-black colored moth about $^{3}/_{8}$ inch long with a wing span of approximately $^{1}/_{2}$ inch. Due to their size and the fact that they are most active at night, the adults are often difficult to find. The adults often rest on nut clusters or foliage close to clusters where they can be found by close examination during daylight hours. Pheromone and blacklight traps are also effective for capturing moths and are the preferred methods for taking surveys and making management decisions.

Eggs are deposited singly on the outside of the pecan nut shuck and sealed down with a gelatin-like material. This material becomes creamy, chalky white and is a distinctive characteristic of egg deposit sites. After a few days, the eggs hatch and the small larvae burrow into the shuck. The immature larvae are small white caterpillars. Full grown larvae are approximately $^{1}/_{2}$ inch long, with creamy to dirty-white bodies, reddish brown heads, and conspicuous black spots over their abdomens.

The pupae are found within the tunneled areas of the shuck, or protruding from small exit holes made by the larvae. They are golden brown to dark tan, and all their appendages are tightly molded to their bodies. Pupae are approximately $^{1}/_{4}$ - $^{1}/_{3}$ inch long. The adults emerge through slits in the backs of the pupae.

The hickory shuckworm attacks from the time nuts are first formed in early June until harvest. Prior to shell hardening, larval feeding within the nut causes premature nut drop. After shell hardening, larvae are confined to feeding within the shuck. Damage resulting from the shuckmining activities of the larvae include poor kernel development (due to severed vascular tissue in the shuck), shuck sticking, scarred and discolored shell, and delayed nut maturity. Except for premature nut drop, shuckworm damage usually goes unnoticed unless the shuck is cut open to reveal larvae tunneling.

SEASONAL HISTORY

Hickory shuckworm overwinters as mature larvae within the shucks either on the ground or on the tree. Pupation occurs within the shuck, usually in late winter or early spring, with adult emergence beginning in late March or early April. In some areas adult shuckworms have been reported emerging as early as mid-February. Moths emerging in the spring, prior to nut formation, lay their eggs on pecan foliage, the galls of pecan phylloxera, and nuts of early developing hickories. Shuckworms hatching from eggs deposited on the foliage will generally die before completing their life cycle. However, those larvae developing within phylloxera galls or hickory nuts are able to complete their life cycle, thus maintaining the population until nut formation occurs. Researchers have also reported that adult moths of the overwintering generation emerge from the shucks as late as July, August and September. During the summer months, female shuckworms begin to deposit their eggs on the nuts. After nut formation occurs, shuckworm populations usually increase with each succeeding generation. The number of generations per year will vary from two to five depending on location.

— *Pecan Growers Handbook*, GA.

CONTROL MEASURES

Presently, there is no specific pest management program for this insect. Not only do control procedures vary from state to state, but they may also vary between orchards within a given state. Since this is a relatively new pest to New Mexico, it is even more difficult to make specific recommendations to growers. However, here are a few common sense recommendations.

Cultural practices may be used to reduce shuckworm infestations, and may reduce or eliminate the need to use insecticides under some circumstances. Where practical, remove or burn old shucks. Discing under old shucks, dropped nuts and debris will help prevent adults from emerging. (When discing, be careful not to damage roots.) Encourage your neighbors to follow these practices, too.

You can use one of two schedules for applying insecticides: spraying on a fixed schedule, or monitoring with blacklight and pheromone traps and spraying as needed. If these traps are not available, you may have to spray on a fixed schedule. However, fixed-schedule spraying may not provide adequate control.

Monitoring and spraying as necessary is a more efficient control method. If you are monitoring with blacklight and pheromone traps, you can detect shuckworm months, chart population growth, and monitor activity throughout the growing season. With this information, you can schedule spraying only when adult moths are present in critical numbers. In general, only the mid-summer generations (around shell hardening time) are numerous enough to require chemical control.

The pesticides listed for control include:

Sevin	80S.
ASANA	1.9 E.C., XL
Imidan	50WP, 12.5 WP
Fury	1.5 E.C.
Guthion	25% W.P., 2L., 50% W.P., 35% W.P.

Orchard owners should monitor fields closely and consult with local county agents and agriculture field workers.

REFERENCES

Alabama Pecan Production in the Southeast, Circular ANR-459, ACES, Auburn University.

Pecan Growers Handbook, CES/University of Georgia, College of Agriculture, Athens, GA.

1998 Extension Agent's Handbook of Insect, Plant Disease and Weed Control, Oklahoma State University.

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